

**Claims:**

1. An optical imaging contrast agent with affinity for an abnormally expressed biological target associated with lung cancer.

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2. A contrast agent as claimed in claim 1 with molecular weight below 14 000 Daltons.

3. A contrast agent as claimed in claim 1 or 2 of formula I

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V-L-R, (I)

wherein V is one or more vector moieties having affinity for an abnormally expressed target in lung cancer, L is a linker moiety or a bond and R is one or more reporter moieties detectable in optical imaging.

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4. A contrast agent as claimed in any of claims 1 to 3 comprising a contrast agent substrate, wherein the target is an abnormally expressed enzyme, such that the contrast agent changes pharmacodynamic properties and/or pharmacokinetic properties upon a chemical modification from a contrast agent substrate to a contrast agent product upon a specific enzymatic transformation.

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5. A contrast agent as claimed in any of claims 1 to 4 having affinity for any of the targets selected from galectin-3, cancer antigen 125 (CA125), cathepsin L, MUC1, caspase-9 and -3, cyclo-oxygenase-2 (COX-2), glutathione-S-transferase (GST), the angiopoietin receptors, integrin  $\alpha\beta 3$ , vascular endothelial growth factor receptor (VEGF), HER2/epidermal growth factor receptor (EGFR), MDR, urokinase plasminogen activator receptor and cyclin D1.

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6. A contrast agent as claimed in any of claims 3 to 5 wherein V is selected from peptides, peptoid moieties, oligonucleotides, oligosaccharides, fat-related compounds and traditional organic drug-like small molecules.

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7. A contrast agent as claimed in any of claims 3-6 wherein R is a dye that interacts with light in the wavelength region from the ultraviolet to the near-infrared part of the electromagnetic spectrum.

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8. A pharmaceutical composition for optical imaging of lung cancer comprising a contrast agent as defined in any of claims 1 to 7 together with at least one pharmaceutically acceptable carrier or excipient.

5 9. Use of a contrast agent as claimed in any of claims 1 to 7 for the manufacture of a diagnostic agent for use in a method of optical imaging of lung cancer involving administration of said diagnostic agent to an animate subject and generation of an image of at least part of said subject.

10 10. A method of optical imaging of lung cancer of an animate subject involving administering a contrast agent as defined in any of claims 1 to 7 to the subject and generating an optical image of at least a part of the subject to which said contrast agent has distributed.

15 11. Method as claimed in claim 10 for diagnosis of lung cancer, for follow up of the progress of lung cancer development, for follow up of treatment of lung cancer or for surgical guidance.

20 12. Use of a contrast agent as defined in any of claim 1 to 7 for optical imaging of lung cancer.

25 13. Use of a contrast agent as claimed in claim 12 for diagnosis of lung cancer, for follow up of the progress of lung cancer development, for follow up of treatment of lung cancer or for surgical guidance.